

Patent Abstracts of Japan

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PUBLICATION DATE : 16-09-83

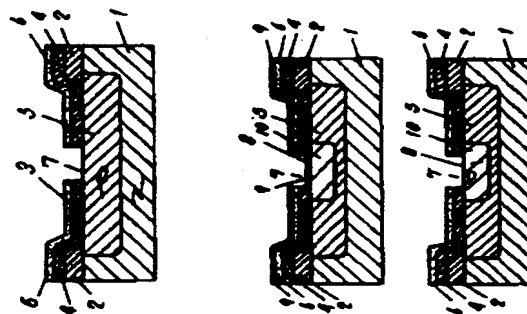
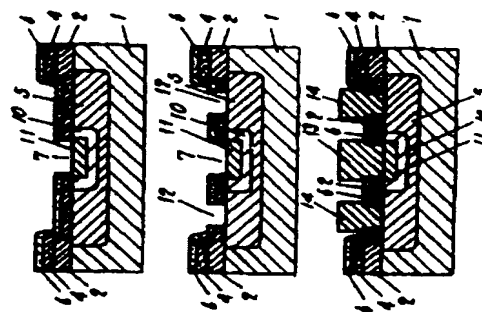
APPLICATION DATE : 10-03-82
APPLICATION NUMBER : 57038421

APPLICANT : MATSUSHITA ELECTRONICS CORP;

INVENTOR : YAMASHITA YASUHISA;

INT.CL. : H01L 29/72

TITLE : MANUFACTURE OF
SEMICONDUCTOR DEVICE



ABSTRACT : PURPOSE: To obtain a transistor, base resistance thereof is small and withstand voltage between emitter-base thereof is high, by forming an Si_3N_4 film with a predetermined window to an Si substrate and forming a region with concentration lower than other sections near the window.

CONSTITUTION: The SiO_2 film 2 on an N type Si 1 is bored, the surface is coated with an SiO_2 4 containing an impurity, and a P^+ base 5 is formed. An Si_3N_4 film 6 is stacked, and the films 6, 4 are bored. The whole is treated at a high temperature in O_2 , the surface is coated with a SiO_2 film 9 while the impurity is diffused to the outside from the exposed section 8 of the layer 5 and its periphery, and a base region 10 with low concentration is formed. The SiO_2 film 9 is removed through etching and the surface is bored 7 again, and an N emitter layer 11 is diffused. A base connecting window 12 is formed and electrodes 13, 14 are attached. According to such constitution, the base layer 5 with high impurity concentration can be formed while maintaining withstand voltage between the low-concentration base region 10 and the emitter 11, and the bipolar transistor having excellent electrical characteristics is obtained.

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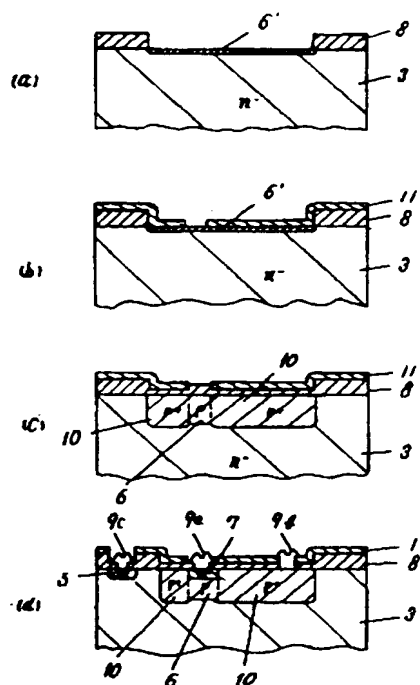
APPLICATION DATE : 02-07-82
APPLICATION NUMBER : 57115777

APPLICANT : MATSUSHITA ELECTRONICS CORP;

INVENTOR : TOYOOKA TETSUO;

INT.CL. : H01L 29/72

TITLE : MANUFACTURE OF
SEMICONDUCTOR DEVICE



ABSTRACT : PURPOSE: To contrive to form an element into a low noise one by realizing the same structure as that of a graft base transistor without increasing the number of masks by a method wherein a second insulation film is formed on the aperture of a base region, and the insulation film on an active base region is selectively removed by etching, thereafter diffusion treatment is performed in oxidizing atmosphere.

CONSTITUTION: After forming the oxide film 8 on an n type epitaxial layer 3, it is selectively removed by etching, thus the base region of an n-p-n transistor is opened, and then a boron layer 6' is vapor-deposited. After forming the second insulation SiO_2 film 11 on the base region, it is selectively removed by etching by means of an emitter forming mask. Thereafter, boron is diffused in oxidizing atmosphere. Thereat, the sheet resistance of the active base region 6 is absorbed by a thermal oxide film during the diffusion of boron of an impurity, and accordingly becomes higher than the sheet resistance of an external base region 10. Using the emitter forming mask again, the emitter region is opened through the thermal oxide film by a photoetching method, and the formation of an emitter region 7 is performed by vapor-depositing and diffusing phosphorus.

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